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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/727,748	11/30/2000	Prathap Haridoss	10964-043001/ Case 629	4182
26161	7590	10/24/2003	EXAMINER	
FISH & RICHARDSON PC 225 FRANKLIN ST BOSTON, MA 02110			CANTELMO, GREGG	
			ART UNIT	PAPER NUMBER

1745

DATE MAILED: 10/24/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/727,748

Applicant(s)

HARIDOSS ET AL.

Examiner

Gregg Cantelmo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) 1-6,8-10,14-16 and 18-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-10,14-16 and 18-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Response to Amendment***

1. In response to the amendment received July 31, 2003:
  - a. The 112 rejection stands;
  - b. The prior art rejection stands as modified in light of the amendments to the independent claims.

***Specification***

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the specification fails to recite the limitation of the amount of non-electrolytic material in the composition being less than about 30%.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-6, 8-10, 14-15, and 21-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the

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application was filed, had possession of the claimed invention. The amendment to claims 1 and 21 are considered to constitute new matter with respect to the instant application's original disclosure.

5. As set forth above, the only recitation of the percentage of non-electrolytic material in the composition is found in the claims. There is no such teaching in the original disclosure apart from that. Therefore, the only manner in which the written disclosure can incorporate such limitations is in the manner in which the claim is linked. Incorporating claim limitations not supported in the written disclosure apart from the claims cannot be preferentially linked to other claim limitations when the original disclosure fails to support such linking. Thus the percentage of the non-electrolytic material as now amended into independent claims 1 and 16, fails to have adequate linking to the dependent claims associated with the original claim 1 and therefore the current combination raises new matter issues since the original disclosure failed to appreciate such combinations.

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-10, 14-16 and 18-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the

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application was filed, had possession of the claimed invention. There is no explicit recitation of the composition being "substantially free of carbon fibers" in the original disclosure and thus there is no apparent support for this limitation.

Any negative limitation or exclusionary proviso must have basis in the original disclosure. If alternative elements are positively recited in the specification, they may be explicitly excluded in the claims. See *In re Johnson*, 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977) ("[the] specification, having described the whole, necessarily described the part remaining."). See also *Ex parte Grasselli*, 231 USPQ 393 (Bd. App. 1983), *aff'd mem.*, 738 F.2d 453 (Fed. Cir. 1984). The mere absence of a positive recitation is not basis for an exclusion. Any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph as failing to comply with the written description requirement. See MPEP § 2173.05 (i).

While the Examiner has considered Applicant's statements as to why such limitations are allegedly supported by the original disclosure, the Examiner respectfully disagrees.

First, one of ordinary skill in the art would not have been led to conclude that the electrodes are free of carbon, let alone more specifically to carbon fibers as recited in the claims. Furthermore, on page 10 of the instant application, U.S. patent No. 5,211,984 is incorporated by reference pertaining to the method of making the membrane electrode assemblies. Review of this reference shows that the electrode supports formed therein include carbon supported catalysts (see abstract). Absent

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clear teachings for exclusion of carbon fiber catalyst supports there is no reasonable expectation that such would have been appreciated by the original disclosure considering the lack of clear teaching of the negative limitations as recited in claims 1, 16 and 21, the teachings of U.S. patent No. 5,211,984, incorporated by reference in the instant application, and further the fact that one of ordinary skill in the art would consider carbon supports as well known catalyst supports in fuel cells. Therefore the claimed limitation of the composition being "substantially free of carbon fibers" is held to be new matter.

### ***Response to Arguments***

8. Applicant's arguments filed July 31, 2003 have been fully considered but they are not persuasive.

Applicant argues that the carbon of Wilson is in the form of particles and not fibers.

This argument is not persuasive with respect to the manner in which the instant claim has been amended in that while the claim recites fibers as opposed to particles, there is no explicit teaching in the instant application for the composition being substantially free of carbon fibers.

The crux of applicant's arguments is that the incorporated reference teaches of particles as opposed to fibers. Yet one cannot ignore that in the context of the overall teachings of the combination of incorporated disclosure that there is a clear teaching of incorporating carbon in the composition, regardless as to whether they are particles or

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fibers, as argued by applicant. Applicant fails to explain why, fibers and particles are critically different with respect to the claimed invention and thus such arguments fail to persuade the examiner.

The instant applicant fails to teach of the criticality of the absence of carbon fibers as opposed to carbon particles and the argument fails to clearly show how one of ordinary skill in the art would have found the shape of the particles to be ample support for the limitation amended to the claims.

Rather, one of ordinary skill in the art, given the disclosure of the instant applicant would have never been adequately drawn to the claimed invention having carbon within the composition and absent clear evidence to the novelty and criticality of fibers as opposed to particles, still is held to be a new matter issue.

The Examiner additionally incorporates the arguments recited in item 4 of the previous office action.

### ***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-8, 10, 14-15 and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent No. 5,945,231 (Narayanan).

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Narayanan discloses a composition comprising a Pt catalyst, zirconium oxide which is a first material resistant to oxidation up to about 3.0 Volts vs. SHE and a non-electrolytic PTFE material which is different than the catalyst, wherein the catalyst is distributed on the zirconium oxide with a load (inherent) and the composition composes a fuel cell electrode and there is no disclosure of the fuel cell electrode having carbon fibers (col. 9, ll. 24-50 and prior art claims 1, 5, 7, 8 and 14). Also upon further consideration, given the it appears that Narayanan does in fact teach of a catalyst to oxide ration which teaches of the load range of claim 1. The catalyst mixture can include about 30-50% or zirconium oxide (col. 9, ll. 48-50) given the ratio of catalyst to oxide therein there is a reasonable expectation that the amount of catalyst will be within the range of about 5 percent to about 95 percent load. The term about with respect to the significantly vast range of 5 to 95% is not held to clearly define what ranges are excluded from the term about apart from 0% and 100% (as applied to claim 1).

The platinum catalyst is capable of catalyzing oxidation of a fuel cell gas (as applied to claim 2).

The fuel cell gas inherently comprises hydrogen (as applied to claim 3).

The platinum catalyst is capable of undergoing reversible oxide formation (as applied to claim 4).

The catalyst is platinum (as applied to claim 5).

The composition of materials includes 7-10% catalyst (col. 4, ll. 1-4 as applied to claim 6).



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The composition of materials includes 15-20% TFE-30 (col. 4, ll. 1-4 as applied to claim 7).

The non-electrolytic material comprises a fluorine containing resin (col. 4, ll. 1-4 as applied to claim 8).

The non-electrolytic material is PTFE material, discussed above (as applied to claim 10).

The first material comprises zirconium oxide, as discussed above (applied to claims 14 and 15).

Narayanan discloses a composition comprising a Pt catalyst, zirconium oxide which is a first material resistant to oxidation up to about 3.0 Volts vs. SHE and a non-electrolytic PTFE material, wherein the catalyst is distributed on the zirconium oxide and the composition composes a fuel cell electrode and there is no disclosure of the fuel cell electrode having carbon fibers (col. 9, ll. 24-50 and prior art claims 1, 5, 7, 8 and 14 as applied to claim 21).

The catalyst comprises platinum, as discussed above (applied to claim 22).

The first material comprises zirconium oxide, as discussed above (applied to claim 23).

The non-electrolytic material is PTFE, as discussed above (applied to claim 24).

### ***Response to Arguments***

11. Applicant's arguments with respect to claims 1-10 14-15 and 21-24 have been considered but are moot in view of the new ground(s) of rejection.

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Applicant argues that Narayanan does not teach or suggest the percentage of non-electrolytic material as now recited in claims 1 and 21.

The Examiner respectfully disagrees.

The instant application fails to define that the non-electrolytic material encompasses both nafion and a resin as argued by Applicant.

An analysis of the claims would suggest that the manner in which such a percentage is interpreted is related to the resin percentage (see claims 9 and 10).

Narayanan discloses the same resin percentages relative to the composition as discussed above and thus still anticipates the claimed invention.

### ***Response to Arguments***

12. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

With respect to claims 1 and 21, Applicant argues the percentage of non-electrolytic material.

A clear evaluation of the original disclosure, first and foremost, shows an absence of criticality with respect to the amount of the non-electrolytic material.

Second the instant application teaches only that the non-electrolytic material comprises various resins (see claims 9 and 10 as examples).

The prior art of Narayanan discloses using the same amounts of resin, such as TFE -30 to be 15-20%. The instant claims do not clearly define that the non-electrolytic

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material encompasses the Nafion solution. And the disclosure of the instant application does not lead one of ordinary skill in the art to such a conclusion.

***Claim Rejections - 35 USC § 103***

13. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Narayanan in view of U.S. patent No. 4,847,173 (Mitsunaga).

The teachings of claim 1 have been discussed above and are incorporated herein.

The difference between instant claim 9 and Narayanan is that Narayanan does not teach or the non-electrolytic material being a copolymer of tetrafluoroethylene and hexafluoropropylene.

The catalyst layer is composed of catalyst powder and a binding agent. The catalyst powder consists of fine particles of platinum which is carried on the surface of carbon powder. For the binding agent, fluorine-containing resins such as polytetrafluoroethylene (PTFE), copolymers of tetrafluoroethylene/hexafluoropropylene (hereinafter referred to simply as "FEP"), and others are suitable (Mitsunaga col. 3, ll. 13-20).

Thus Mitsunaga establishes that both PTFE and FEP are known binding agents for catalytic materials used in fuel cell electrodes and one of ordinary skill in the art would have found it obvious to substitute PTFE for FEP since they are suitable binding agents.

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Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Narayanan by replacing the PTFE binder with FEP binder since Mitsunaga establishes that these material are both suitable binding agents for catalytic materials employed in fuel cell electrodes and the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

### ***Claim Rejections - 35 USC § 103***

14. Claims 16 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narayanan in view of U.S. patent No. 5,599,638 (Surampudi).

Narayanan discloses a composition comprising a Pt catalyst, zirconium oxide which is a first material resistant to oxidation up to about 3.0 Volts vs. SHE wherein the catalyst is distributed on the zirconium oxide and the composition composes a fuel cell electrode and there is no disclosure of the fuel cell electrode having carbon fibers (col. 9, ll. 24-50 and prior art claims 1, 5, 7, 8 and 14 as applied to claim 16).

Also upon further consideration, given the it appears that Narayanan does in fact teach of a catalyst to oxide ration which teaches of the load range of claim 18. The catalyst mixture can include about 30-50% or zirconium oxide (col. 9, ll. 48-50) given the ratio of catalyst to oxide therein there is a reasonable expectation that the amount of catalyst will be within the range of about 5 percent to about 95 percent load. The term

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about with respect to the significantly vast range of 5 to 95% is not held to clearly define what ranges are excluded from the term about apart from 0% and 100% (as applied to claim 18).

The first material comprises zirconium oxide, as discussed above (applied to claims 19 and 20).

The difference between Narayanan and claim 16 is that Narayanan does not explicitly disclose of the catalyst load range of claim 16.

The catalyst of Narayanan is loaded onto the electrode.

Surampudi, drawn to the same general invention as Narayanan discloses that catalyst loading ranges from 0.5-5 mg/cm<sup>2</sup> are suitable catalyst levels applied to the electrode in a fuel cell.

The instant application fails to establish criticality of the particular claimed range and thus one of ordinary skill in the art would have found a catalyst loading including the range recited in the instant claim to have been an obvious catalyst load level.

Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical.

In re Boesche, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

### ***Response to Arguments***

**15.** Applicant's arguments with respect to claims 16 and 18-20 have been considered but are moot in view of the new ground(s) of rejection.

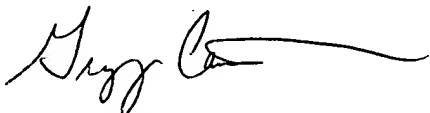
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***Conclusion***

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (703) 308-2383. FAX communications should be sent to the appropriate FAX number: (703) 872-9311 for After Final Responses only; (703) 872-9310 for all other responses. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gregg Cantelmo  
Patent Examiner  
Art Unit 1745

gc



October 17, 2003